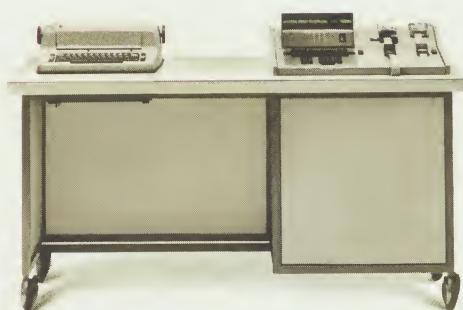




AN INTRODUCTION TO THE PDS 1020 DIGITAL COMPUTER



PACIFIC DATA SYSTEMS, INC.
A SUBSIDIARY OF ELECTRONIC ASSOCIATES, INC.



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GENERAL PURPOSE DIGITAL COMPUTER

PDS 1020

If the problems you are now solving require a good deal of time . . . if they are recurring in nature, though varying in data . . . if you have to rely on manual trial and error, intuition, experience or rule of thumb because more thorough mathematical analysis is too complicated, costly and time consuming . . . if problem solving steps have to be checked and double checked for errors because of their length and tediousness . . . chances are, you need a full scale Digital Computer like the PDS 1020.

The PDS 1020 – A competitive necessity

Pacific Data Systems has recently introduced the PDS 1020, a general purpose, internally stored programmed digital computer that is well within the reach of budget-minded engineering and scientific organizations. With its large memory capacity, ease of programming and input/output flexibility, the PDS 1020 provides the engineer and scientist with a powerful computing tool that is easy to use, simple to understand and directly accessible for operation by the man with the problem.

Using familiar mathematical terms, the engineer solves his problem with push-button ease. The secret is in the uniquely designed keyboard-interpreter combination, which transforms the PDS 1020 into an Engineering/Scientific computer. The engineer can sit down at the console and enter and store the problem for solution directly by the computer. Answers are immediately available typed out at 15 characters per second.

For recurring problems, the PDS 1020 provides a high speed tape punch and reader plus a typewriter output to list the programming steps. This enables the operator

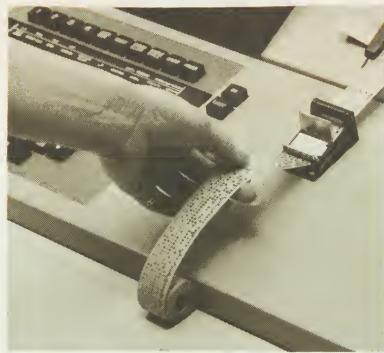
to obtain both typewritten and punched tape records of his problem. The input/output flexibility of the PDS 1020 increases man/machine effectiveness by enabling the operator to examine his problem solving steps and conveniently re-enter them any time they are required to resolve a problem.

Advantages of the PDS 1020

- 1. The PDS 1020 saves engineering time:** It takes over the routine, tedious, time consuming computations, allows the engineering staff to concentrate on creative engineering problems.
- 2. The PDS 1020 increases engineering capabilities:** Many jobs passed up due to lack of design and engineering time will be within your scope with a PDS 1020. Formerly impossible problems with extensive iterative design requirements may now be handled with ease.
- 3. The PDS 1020 reduces errors:** The PDS 1020 never gets tired or bored. It never makes errors in transposition, copying the wrong value out of a table or simple arithmetic mistakes. Once a program is checked out, you can rely on its performance as long as you need it.
- 4. The PDS 1020 improves quality:** The PDS 1020 enables the engineering staff to investigate several design alternatives in less time than it would normally take to arrive at one. In this manner, you can choose the best solution to an engineering problem considering both engineering and cost standards.



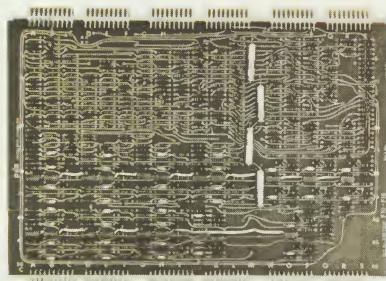
The design and layout of the keyboard simplify both training and operation.



Problem solving programs can be recorded on paper tape and used repeatedly.



Programs and solutions are typed out clearly in the same language and mathematical units that were entered, at the rate of 15 characters per second.



Printed circuit boards and all solid-state circuitry assure longevity and trouble-free operation.



The compact console has all commands needed to communicate with PDS 1020 within reach of the engineer/scientist.



Illuminated panel for users of the PDS symbolic assembler, displays internal register contents and operating state of the machine such as override, single cycle, sense, etc.

PDS 1020

The PDS 1020 – not just another computer.

The PDS 1020 is the only general purpose digital computer that can be operated economically and profitably at any level of computer knowledge and sophistication.

1. To the engineer who has had no previous computer experience, the PDS 1020 offers immediate access to full scale digital computing power. Using the unique PDS Engineering Interpreter, he prepares his own program by entering instructions through the keyboard or high speed tape reader using everyday mathematical terms (not machine language).

In addition to the basic arithmetic operations, he can perform a variety of multi-step algebraic and transcendental functions by using the special function keys on the control panel of the computer, such as, square root, exponentiation, sine, cosine, arctangent and natural log. Many other functions are available and may be easily included in the PDS Engineering Interpreter.

Up to 15 independent programs may simultaneously be stored in the PDS 1020 by the interpreter program. Each of these programs can be immediately re-executed to solve the problems over many ranges of different variables. These programs can also operate independently or cross referenced where one program calls upon another as part of its problem

solving steps. And all of these programs can be permanently recorded for later use.

2. As the engineer masters the basic fundamentals of the computer, he can learn the more advanced techniques of problem solving such as looping, address modifications and the like. He will learn to take advantage of the logic capabilities of the machine in choosing alternate sequences for solving a problem on the basis of computer results.

There is virtually no limit to the type of problems which may be solved using the interpreter program. The user who finds himself in the position of understanding the interpreter and its operation to the fullest extent will find few, if any computations which require machine language. If eventually he does learn machine language, it will be to allow him to modify the interpreter and make it more convenient for his particular applications.

3. The programmer who wants to utilize machine language has at his disposal, full general purpose computer capabilities including over 40 powerful machine language commands, symbolic assembler and such features as built in hardware index register, automatic word length control, and capabilities for both decimal and binary arithmetic.

To any user, regardless of his computer skill, the PDS 1020 offers a convenient means of obtaining fast, direct answers to immediate engineering and scientific problems.

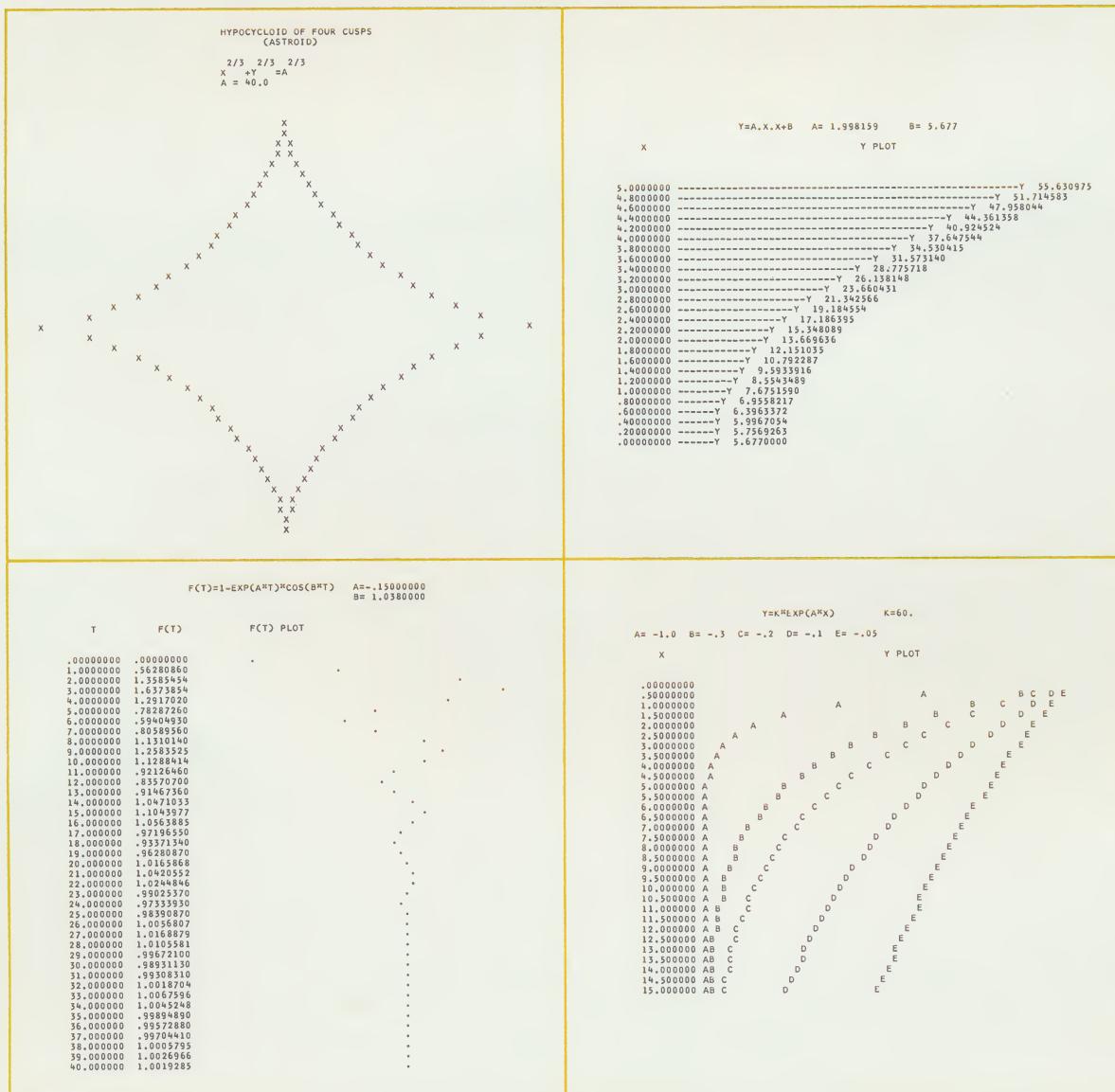
The PDS engineering interpreters – the solution to the man/computer communications barrier

The PDS engineering interpreter is a unique program that transforms the PDS general purpose digital computer into a powerful, easy to use engineering and scientific computer with the following outstanding features: Fixed point and floating point input Fixed point and floating point output 8 significant figure arithmetic Multiple loop counters Over 20 arithmetic, control, modification and decision instructions Immediate typewritten records of all retained programs Immediate punched tape record of all retained programs Up to 15 retained programs at any time (all variable length) All retained programs may be linked to provide more powerful problem solving Unlimited

change and correction capability for all retained programs Automatic arithmetic and procedural error detection Automatic instruction loop iteration up to 9999 times Complete alpha-numeric message and heading capability Automatic numbering of all program steps.

In addition to its other features, the versatility of the interpreter can transform the PDS 1020 into a digital incremental plotter under your control. It will type out the independent variable and provide a functional plot with an 8-digit value associated with each point. Over 40 plotting symbols can be selected for preparing bar graphs or histograms. Scaling and offset is accomplished by internal interpreter routines.

Applications for the PDS 1020 plotter routines include attenuation and phase diagrams, probability functions, transient response curves (chemical reactions, heat flow), etc.



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Specifications

Type: General Purpose, serial, decimal, internally stored program.

Memory: Magnetostrictive delay line operating at 2.02 megabits per second. Memory is sequentially organized in modules of 1024 words. The basic 1020 configuration contains 2 modules for a total of 2048 words.

Capacity: Expandable to 4096 words.

Word Length: 4 decimal digits and sign. Variable in 4 digit multiples up to 24 decimal digits and sign.

Machine Registers: Seven (instruction, next instruction, field length, index, link address, sign, and accumulator).

Register Display: Contents of the various registers can be checked in the register display lights without resorting to scopes or other indirect viewing devices by setting the display switch to the appropriate register.

Execution Times: Load/copy 4.6 msec. avg. Add/subtract 4.6 msec. avg. Multiply/divide 23 msec. avg.

Physical: Dimensions (desk) 57" long x 27" wide x 30" high. Weight 350 pounds.

Power Requirements: Source 115 VAC, 60 cycle, single phase* Consumption 475 watts. Convenient outlet up to 10 amps, max.

*can be adapted to 50/60 cycle, 220 VAC

Input/Output: 15 character per second output typewriter (input optional)

50 characters per second paper tape reader 50 character per second paper tape punch Full alpha-numeric capability—reads any arbitrary 8 level code or punch

Numeric input keyboard

17 bit parallel input and output channels

Of course, the simplicity and flexibility of the PDS 1020 are best appreciated when demonstrated. Demonstrator models of the PDS 1020 are continually in the field for this purpose. If you wish to see and operate the new PDS 1020 computer, contact Pacific Data Systems. A demonstration will be arranged at your convenience.

Serviced internationally by Electronic Associates, Inc., a staff of field service engineers, backed by the largest service engineering department in the industry, is your assurance that any problems will be handled quickly and efficiently.

How to use the PDS 1020 in a matter of hours and without learning computer language is described in **The Engineers' Guide to the PDS 1020**. To receive a copy, write Pacific Data Systems, Inc., 1058 East First Street, Santa Ana, California, Phone (714) 547-9183, TWX 714-531-0188.



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